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FACTORS CAUSING STUNTING IN TODDLERS

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ABSTRACT
Nutritional problems in toddlers are still a major problem in the population order, one of which is stunting which is still a major nutritional problem in developing countries such as Indonesia and even still a serious global problem. The purpose of the study was to determine the factors causing stunting in toddlers in the working area of the Puskesmas Terjun, Medan Marelan District. This study used analytical survey research using a case-control design. The population of cases is mothers who have toddlers <5 years old who are stunted in the working area of the Puskesmas Waterfall Medan Marelan District, which has 23 stunting cases. Sampling is done by total sampling technique. Case and control samples were taken based on a ratio of 1: 2 with a total sample of 69 respondents. The results showed that there was a relationship between birth length (p-value 0.000), exclusive breastfeeding (p-value 0.000), maternal height (p-value 0.000), and maternal education (p-value 0.001) on the incidence of stunting. There was no relationship between birth weight (p-value 0.081) and birth distance (p-value 0.085) with the incidence of stunting in toddlers. This study concludes that there is a relationship between birth length, exclusive breastfeeding, maternal height, and maternal education with the incidence of stunting in the work area of the Puskesmas Waterfall, Medan Maryland District. It is recommended that researchers conduct further research by adding direct causal variables to enrich information about the factors that cause stunting in toddlers.

Keywords: birth length; education; exclusive breastfeeding; mother's height; stunting

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INTRODUCTION

Nutritional problems in toddlers are still a major problem in the population order. Nutritional problems in toddlers include: *stunting*, *wasting*, and being *overweight*. *Stunting* is still a major nutritional problem in developing countries such as Indonesia and is even still a serious global problem. According to the World Health Organization (WHO) In 2022, there are 148.1 million (22.3%) children under the age of 5 who are too short compared to their age (*stunting)* (WHO, 2023). Based on WHO in 2020 prevalence of *stunting* in the Asian region has numbers *stunting* highest is 79 million children (52.9%), especially in Southeast Asia (54.3 million children), followed by Africa at 61.4 million children (41.1%) and Latin America at 5.8 million children (3.8%) (Ministry of Health, 2022). Data from the 2022 National Nutritional Status Survey (SSGI), shows the prevalence of *stunting* in Indonesia is 21.6%. This number decreased compared to the previous year which was 24.4%. Although declining, the figure is still high, considering the target prevalence of *stunting* in 2024 it will be 14% according to WHO standards below 20% ((WHO), 2018). Number *stunting* The highest in Indonesia is in the province of East Nusa Tenggara (36.3%) and the lowest is in the province of Bali (8.0%). (SSGI, 2022)

In North Sumatra Province *Stunting* is still a problem that is the focus of activities to be controlled. Prevalence *stunting* in North Sumatra Province according to SSGI 2022 is 21.1%, this prevalence has decreased by 4.7% from the previous year which was 25.8% in 2021. Districts by numbers *stunting* the highest in 2022 is South Tapanuli at 39.4% and the lowest is North Labuhanbatu at 7.3% (PEMERINTAH PROVINSI Sumatera Utara, 2023) The number of stunting toddlers in Medan according to SSGI 2022 data is 15.4%. It was recorded that the number of *stunting* under five in Medan City was 364 toddlers in 2022 and decreased to 251 toddlers in 2023 spread across 21 districts and 41 puskesmas work areas in the city of Medan. The highest number of *stunting* cases in the working area of the Waterfall Health Center with 35 cases of toddlers, followed by the Secanang Health Center with 21 cases, and the lowest *stunting* cases are in the health center areas of Matsu, Teladan, Padang Bulan, Glugur City, Sei Agul, and Sentosa Baru which have 0 *stunting* cases (no stunting toddlers). (Secondary Data of Medan City Health Office, 2023).

Based on data obtained from the Puskesmas Waterfall, Medan Marelan District, the *stunting* rate in January 2024 in the working area of the Puskesmas Terjun is 23 toddlers, this has decreased from October 2023, which is 35 cases. Secondary Data of Puskesmas Waterfall 2024) According to UNICEF and WHO, factors influencing the incidence of *stunting* in toddlers, namely unbalanced eating, infectious diseases, low household food security, malnutrition during pregnancy, short mothers, antenatal care, low birth weight, exclusive breastfeeding, sanitation, and cleaning, inadequate health services, and knowledge, quality of human resources, economy, and utilization of environmental resources (Sevilla Ukhtil Huvaid, 2021) Research conducted by (Nursyamsiyah, 2021) on 14 causative factors in *stunting* 4 variables has a significant relationship ($p < 0.05$) between immunization history, maternal height, maternal education, and family income with the incidence of *stunting* in children aged 24-59 months in one of the villages of the Puskesmas working area in West Bandung Regency. Child sex, birth length, birth weight, history of infection, history of exclusive breastfeeding, history of breast milk MP, age of mother at childbirth, father's education, father's occupation, and mother's occupation did not show a significant relationship with the incidence *stunting* (Nursyamsiyah, 2021).

The adverse effects that can be caused by *stunting* are short-term disruption of brain development, and intelligence, impaired physical growth, and metabolic disorders in the body. In the long run, the adverse consequences that can be caused are decreased cognitive ability and learning achievement, decreased immunity so that it is easy to get sick, and a high risk for the emergence of diabetes, obesity, heart and blood vessel disease, cancer, stroke, and disability in old age. Based on the above background, researchers are interested in following up research on the factors that cause *stunting* in toddlers in the work area of the Puskesmas Terjun, Medan Marelan District.

METHOD

This study used analytical survey research using a case-control design. This research was conducted in February – March 2024 in the working area of the Puskesmas Waterfall, Medan Marelan District. The population in this study was all mothers who had toddlers aged <5 years who were stunted. The population in this study was divided into two, namely the case and control populations. The population of cases is mothers who have toddlers <5 years old who are stunted in the working area of the Puskesmas Waterfall Medan Marelan District, which has 23 stunting cases. The Control Population is mothers who have toddlers <5 years old who are not stunted.

Sampling was carried out using the total sampling technique where the number of samples was equal to the population, namely 23 mothers who had toddlers <5 years old stunted. Case and control samples were taken based on a ratio of 1: 2 with the sample needed was 23: 46 with a total sample of 69 respondents. Primary data collection was carried out by conducting interviews with respondents using questionnaires containing questions related to the research conducted and height measuring instruments (microtome) to determine the mother's height. Univariate analysis aims to explain or describe the characteristics of each research variable. Bivariate analysis is an analysis carried out on two variables, namely Independent and Dependent which are thought to have a correlation or relationship. Bivariate analysis using SPSS 20 software with Chi-Square test analysis at a meaning level of 95% (α 0.05). The estimated sample size is calculated using the Odd Ratio (OR). The odds ratio is used as an indicator of the existence of a causal relationship between risk factors and effects.

RESULTS

Table 1.
Characteristics of Respondents

Characteristics of Respondents	f	%
Gender		
Man	26	37,7
Woman	43	62,3
Stunting Insident		
Stunting	23	33,3
Not stunting	46	66,7
Birth Weight		
BBLR < 2500	18	26,1
Normal ≥ 2500	51	73,9
Body Length at Birth		
Short >48 cm	28	40,6
Normal ≥ 48 cm	41	59,4
ASI Ekslusif		
Ekslusif	33	47,8
Not Ekslusif	36	52,2
Mother's Height		
Short < 162 cm	36	52,2
Normal ≥ 162 cm	33	47,8
Mother's Educational Status		
Low	28	40,6
Tall	41	59,4
Birth Distance		
Near < 2 years	29	42,0
Normal ≥ 2 years	40	58,0

Table 1 shows that out of 69 respondents, more than half of the toddlers were female, 43 (62.3%). Of the 69 respondents under five, 23 of them were *stunted,* namely (33.3%). Some toddlers have a history of normal birth weight ≥ 2500 grams which is 51 (73.9%) and more than half of toddlers have a history of normal birth length ≥ 48 cm which is 41 (59.4). There were 33 (47.8%) children under five who received Exclusive breastfeeding for 6 full months, while 36 (52.2%) toddlers did not get exclusive breastfeeding for 6 full months. Mothers who have a short height (<162 cm) are 36 (52.2) more than mothers who have a normal height (≥ 162) which is 33 (47.8%). Most mothers have higher education status (>SMP), which is 41 (59.4%) compared to mothers.

Table 2.
Relationship between causal factors and the incidence of stunting

Variable	Stunting Incident						*p-value*	OR (95% CI)
	Stunting		Not *Stunting*		Total			
	n	%	N	%	n	%		
Birth Weight								
BBLR	9	50	9	50	18	100	0,081	2,643 (0,871-8,019)
Not BBLR	14	27,5	37	72,5	51	100		
Body Length at Birth								
Short	19	67,9	9	32,1	28	100	0,000	19,529 (5,315-71,741)
Normal	4	9,8	37	90,2	41	100		
Exclusive breastfeeding								
Not Exclusive	19	52,8	17	47,2	36	100	0,000	0,123 (0,036-0,424)
Exclusive	4	12,1	29	87,8	33	100		
Mother's Height								
Short	21	58,3	15	41,7	36	100	0,000	21,700 (4,488-104,928)
Normal	2	6,1	31	93,9	33	100		
Mother's Education								
Low	16	57,1	12	42,9	28	100	0,001	6,476 (2,144-19,561)
Tall	7	17,1	34	82,9	41	100		
Birth Distance								
Near	13	44,8	16	55,2	29	100	0,085	2,438 (0,876-6,784)
Normal	10	25,0	30	75,0	40	100		
Total	23	33,3	46	66,7	69	100		

DISCUSSION

The Relationship Between Birth Weight and the Incidence of *Stunting*

Based on table 2 above, it can be seen that of the 18 toddlers who have a history of low birthweight, 9 of them (50%) have stunting events and of 51 toddlers who do not have a history of low birthweight, 37 of them (72.5%) are not *stunted*. And from the results of *the Chi-square* test analysis shows a p-value = *0.081 which* means there is no significant relationship between birth weight and the incidence of *stunting*. This study is in line with previous research by Nursyamsiyah et al. (2021) which showed that birth weight did not have a meaningful relationship with the incidence *stunting*. Birth weight has a greater impact on the age of the first 6 (six) months. If in that period the nutritional status of toddlers can be improved, then the possibility of toddler growth will be normal and avoid *stunting*. (Nursyamsiyah, 2021).

This study is also in line with that conducted by Lilik Hartati (2019) which shows that there is no relationship between toddler birth weight and incidence *stunting*. Factors that affect children who experience low birth weight are the intake consumed so as to achieve good growth and nutritional status, in addition to intake as well as good parenting. While children who experience low birth weight are able to pursue growth delays like children who have normal birth weight if the intake of nutrients such as exclusive breastfeeding given by their parents (Lilik Hartati, 2019). However, from the results of the analysis, there are still babies who have BBLR treatment and experience *stunting*. This may be influenced by other factors such as a history of low birth length and not exclusively breastfed so that the growth of the toddler is not optimal compared to his age (*stunting*).

The Relationship of Birth Length in Toddlers with the Incidence of *Stunting*

Based on table 2, it is known that toddlers who have a history of short birth length are more stunted , namely 19 (67.9%) compared to not *stunting* 9 (32.1%) and toddlers with normal birth length are more not *stunted* 37 (90.2%) compared to those who are *stunted*, which is as

many as 4 (9.8%). From the results of the *Chi-square test*, it shows a p-value = 0.000, which means that there is a significant relationship between birth length and the incidence of *stunting* in the work area of the Waterfall Health Center, Medan Marelan District. When viewed based on OR (19,529), it shows that toddlers who have a history of short birth length have a 19.5 times greater risk of *stunting* compared to toddlers who have normal birth length.

This research is in line with that conducted by Augustien Julia Sawitri (2021) which shows that there is a relationship between birth length and incidence *stunting* for toddlers at Puskesmas Tambak Wedi Surabaya. Birth length is one of the important factors that describe the nutritional status of babies during the womb. Low body length indicates a state of poor nutrition due to lack of energy and protein suffered in the past. In addition, poor maternal conditions such as malnutrition, stress, and having congenital diseases can also affect fetal growth and development such as short birth length which will have an impact on the child's height at an early age and adulthood. (Augustien Julia Sawitri, 2021). From the results of the analysis, there are still toddlers with normal birth length but experience *stunting*. According to the researcher's assumption, this happens because other factors such as breastfeeding are not exclusive, which makes toddlers not get nutrients derived from breast milk, causing the toddler not to experience good growth so that the toddler experiences *stunting*.

The Relationship between Exclusive Breastfeeding in Toddlers and the Incidence of *Stunting*

Table 2 shows the results that toddlers who get exclusive breastfeeding are more not *stunted*, namely by 29 (87.8%) and toddlers who do not get exclusive breastfeeding are more *stunted*, namely by 19 (52.8%). From the *Chi-square Test Results* , the result of p-value = 0.000 means that there is a significant relationship between the history of exclusive breastfeeding and the incidence of *stunting* in the work area of the Puskesmas Waterfall, Medan Marelan District. And when viewed from the OR value (0.123) which means that toddlers who do not get exclusive breastfeeding have a 0.1 times greater risk of *stunting* compared to toddlers who get exclusive breastfeeding. This study is in line with previous research conducted by which showed that there is a meaningful relationship between breastfeeding and incidence (Erni Maywita, 2022) *stunting* with an OR value of 1.9 (CI 95%) means that babies who are not exclusively breastfed will experience 1.9 times compared to babies who are exclusively breastfed. Breast milk given exclusively has protective properties on the occurrence of *stunting*. Exclusive breastfeeding for a short period of time is protective against diarrhea and breathing, there is evidence that long-term infection causes *stunting*. The impact of exclusive breast milk in the long term can protect against NCDs, namely hypertension, diabetes, obesity and cholesterol.

This research is also in line with research conducted by Asmaul Husna (2022) that there is a relationship between a history of exclusive breastfeeding and the incidence *stunting* in toddlers. Exclusive breastfeeding does need to be done in order to prevent *stunting*. This is because breast milk is milk produced by the mother and contains all the nutrients needed by the baby for the needs of the baby's growth and development. Exclusive breastfeeding is also useful for strengthening the immune system in infants and has antibodies that play a role in fighting viruses and bacteria that cause disease in the baby's body so as to prevent the occurrence of *stunting*. (Asmaul Husna, 2022). But from the results of the analysis, there are still toddlers who *stunting* even though you have received exclusive breastfeeding. According to the researchers' assumptions this may be influenced by other factors such as short maternal height, where it is known that the mother's height is a genetic factor that is passed down to her child so that the child has a short body compared to his age (*stunting*).

The Relationship Between Maternal Height and the Incidence of *Stunting* in Toddlers

Based on table 2, it shows that mothers who have short height have more *stunting* toddlers, which is 21 (58.3%) and mothers who have normal height have more non-stunted toddlers , which is 31 (93.9). From the results of the *Chi-square test analysis*, it was obtained that the result was p-value = 0.000 which means that there is a significant relationship between the mother's height and the incidence of *stunting* in the work area of the Medan Marelan Waterfall Health Center. And when viewed from the OR value (21.7) which means that mothers who have short height are 21.7 times more likely to have stunting *toddlers* compared to mothers who have normal height. This study is in line with previous research conducted by Futihatul Baidho et al. (2021) which showed that maternal height has a significant relationship with the incidence *stunting* on toddlers in Argodadi Sedayu village Bantul. Human growth is influenced by genetic, environmental and nutritional factors. One form of genetic expression is maternal height. Genetic factors themselves are factors that cannot be changed because of factors that are passed directly from parent to child. Through the genetic instructions contained in the fertilized egg. However, there are other factors that determine a person's height, such as environmental and nutritional constraints are also important issues. (Futihatul Baidho, 2021). However, there are still stunting toddlers in mothers who have normal height. According to the researchers' assumptions, this can happen because of the mother's low education factor so that they do not know the importance of the benefits of exclusive breastfeeding for their toddlers which causes their children not to experience optimal growth.

Relationship between Maternal Education Status and the incidence of *Stunting* in Toddlers

Based on table 2 above shows that of the 28 mothers with low education, 16 of them (57.1%) have stunting toddlers and of 41 mothers with higher education, 34 of them (82.9%) do not have *stunting toddlers*. From the results of the *Chi-square test analysis*, the results of p-value = 0.001 were obtained, which means that there is a significant relationship between the educational status of mothers and the incidence of *stunting* in toddlers in the work area of Puskemas Terjun, Medan Marelan District. And the result of the OR score is (6,476) which means that mothers who have low education status are 6.4 times more likely to have *stunting toddlers* compared to mothers who are highly educated. This research is in line with research conducted by Komalasari (2020) which shows that there is a relationship between maternal education and the incidence *stunting* in toddlers in Tulung Kakan village, Bumiratu Nuban district, Central Lampung. There is a relationship between maternal education and incidence *stunting* This is in accordance with the theory that states that education plays a role in changing attitudes and positive behavior. The higher the education, knowledge and skills, the possibility of good levels of family food security, the better the pattern of parenting, the more aware of the importance of exclusive breastfeeding for children(Komalasari, 2020).

This research is also in line with research conducted by Sutarto et al (2020) which has the results of a relationship between the level of maternal education and the incidence *stunting* in toddlers. Low maternal education is the main cause of the incidence *stunting* in schoolchildren and adolescents in Nigeria. Mothers who are more highly educated are more likely to make decisions that will improve the nutrition and health of their children. The level of education of mothers also determines the ease with which mothers absorb and understand the nutritional knowledge obtained. From the interests of family nutrition, education is needed so that mothers are more responsive to nutritional problems in the family and can take action as soon as possible. (Sutarto, 2020). However, there are still stunting toddlers in mothers who have higher education status. This may be caused by other factors such as a history of low

birth length and short maternal height that cause genetic decline to the child so that the toddler experiences *stunting*.

The Relationship Between Maternal Birth Distance and the Incidence of *Stunting* in Toddlers

Based on the results of table 2, it shows that more mothers who experience close birth spacing (<2 years) have non-stunted toddlers , namely as many as 16 (55.2%) and mothers who experience normal birth spacing (≥ 2 years) are also more likely to have non-stunted toddlers , which is as many as 30 (75.0%). Based on the analysis *of the Chi-square* test, the result was p-value = 0.085, which means that there is no significant relationship between birth distance and the incidence of *stunting* in toddlers in the work area of the Puskesmas Waterfall, Medan Marelan District. This study is in line with previous research conducted by which showed no association between birth spacing and incidence (Dewi Modjo, 2023)*stunting*. The birth distance between two babies is too close, if the family pays attention and takes good care of the child accompanied by adequate nutrition, it will produce a good child. Conversely, mothers who have a long birth distance if they cannot create a good parenting style in nurturing and raising their children are not accompanied by adequate nutrition, it will result in malnutrition in the child. From the results of the analysis, there are still mothers with close birth distances and have toddlers *stunting.* According to the researcher's assumption, this is because the birth distance is too close, causing mothers not to exclusively breastfeed their toddlers because they have been divided with their siblings who have too close an age who still need breast milk too.

CONCLUSION

Based on the purpose of the research and the results of research obtained about the factors causing the incident stunting In toddlers in the working area of the Terjuan Health Center, Medan Marlan District, it can be concluded that. There is a significant relationship between birth length and the incidence of stunting in toddlers (p-value 0.000, OR: 19.529). There is a relationship between the history of exclusive breastfeeding and the incidence of stunting (p-value 0.000, OR: 0.123). There is a significant relationship between maternal height and the incidence of stunting (p-value 0.000, OR: 21.700). There is a relationship between the mother's educational status and the incidence of stunting (value 0.001, OR: 6.476). There was no significant association between birth weight and incidence of stunting (p-value 0.081). There was no significant relationship between birth spacing and incidence stunting (p-value 0,085). It is expected for the Puskesmas to be more able to provide information and attention regarding prevention and handling stunting For mothers who have toddlers, especially mothers who have toddlers stunting. For further researchers to be able to conduct further research with more variables such as direct causal factors to enrich information about the factors that cause stunting in toddlers.

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